Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems	)	PR Docket No. 93-61

REPLY TO OPPOSITIONS TO PETITIONS FOR RECONSIDERATION

Hughes Transportation Management Systems ("Hughes") hereby replies to certain Comments on and Oppositions to Petitions for Reconsideration of the rules adopted in the Report and order in the above-captioned proceeding, released February 6, 1995, ("Report and Order"). On April 24, 1995, Hughes filed a Petition for Reconsideration in this proceeding, proposing changes to the Commission's rule applying a frequency tolerance of 2.5 parts per million ("ppm") to non-multilateration LMS systems. On May 24, 1995, Hughes filed its opposition to certain proposals contained in other petitions for reconsideration in this docket.[1/]

DISCUSSION

FREQUENCY TOLERANCE FOR NON-MULTILATERATION SYSTEMS

The majority of comments discussing the frequency tolerance rule for non-multilateration systems have agreed with Hughes' position that the current rule is far more

1. As corrected by Erratum filed on May 26, 1995.

restrictive than is needed to prevent out-of-band interference, and that it would create an economic burden on the industry. AMTECH Corporation ("AMTECH") and Texas Instruments Incorporated ("TI"), in particular, have taken a position similar to Hughes, and have proposed alternative limits on frequency variation.[2/] However, even the somewhat less restrictive tolerances proposed by AMTECH and TI are not needed to prevent out of band interference. The Commission should carefully avoid any rule that imposes more than the minimum restriction required to ensure that systems operating on adjacent channels enjoy reasonable protection from out-of-band interference. Otherwise, unnecessary limitations on the nature and extent of future non-multilateration services, and unnecessary delays in deployment of such new services will occur.

In its Petition for Reconsideration, Hughes requested that the Commission either: (i) delete the specific frequency tolerance requirement for non-multilateration systems (consistent with the Notice of Proposed Rulemaking), and apply the emission mask to the edges of bands for which systems are actually licensed rather only at sub-band edges; or (ii) increase the tolerance to a level commensurate with bandwidth for a typical non-multilateration system (proposed as 0.066% tolerance). The Commission's stated purpose in adopting the frequency tolerance rule is to "help reduce the potential for interference to systems operating on adjacent frequencies." Report and Order at 47. For non-multilateration systems, which are intended to operate at ranges of less than several hundred

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2. See AMTECH Opposition to and Comments on Petitions for Reconsideration, at 15-18, TI Oppositions to Petitions for Reconsideration at 20.

yards using large numbers of inexpensive mobile transponders, the above proposals will accomplish this purpose in the least restrictive manner.[3/]

No participant in this proceeding has presented evidence contradicting Hughes' findings or its proposals. While AMTECH and TI, who agree with Hughes that the current frequency tolerance is overly strict, have offered alternatives, neither party has provided sufficient reasons why even their proposals are needed to avoid interference.

Furthermore, only two commenters, CellNet Data Systems, Inc. ("CellNet") and Metricom, Inc. ("Metricom"), have expressed opposition to Hughes' proposals. Neither offers any technical or policy justification whatsoever for its position in this regard, and their comments should be discounted. CellNet, for example, merely states that the current technical rules with respect to non-multilateration systems should not be changed. See CellNet Opposition to Petitions for Reconsideration at 11. Metricom asserts that "the frequency tolerance limit of .00025 percent is necessary to reduce potential interference to systems operating on neighboring frequencies." Metricom Oppositions to Petitions for Reconsideration at 18-19. Like CellNet, Metricom offers no technical support for a finding

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3. An additional means for the Commission to ensure that non-multilateration LMS transmissions do not vary unacceptably from authorized frequency bands, without a strict frequency tolerance, would be to prescribe testing criteria showing that the emission mask is not exceeded over a range of temperatures and voltages. This could be accomplished by either measuring emissions directly with a spectrum analyzer as temperature and voltage are varied, or, where this is difficult (such as for mobile transponders), using a combination of room temperature emission measurements and a carrier frequency versus temperature and voltage measurement. Such tests, which could be required for type acceptance, would demonstrate that out-of-band emissions are sufficiently limited without the need to specify a very narrow frequency tolerance, giving LMS system designers flexibility needed to meet performance and cost objectives.

that such interference is likely. Moreover, Part 15 services, the basis for involvement in this proceeding by CellNet and Metricom, will be co-channel with many LMS systems, and thus unaffected by frequency tolerance restrictions for LMS systems. Such devices are secondary to LMS, and, in any event, are unlikely to suffer interference from non-multilateration facilities, which are restricted to small coverage areas.

Notably, Metricom states that "the advent of high-volume equipment being manufactured in the cellular phone industry" will sufficiently reduce the cost of technology necessary to meet the current frequency tolerance for non-multilateration systems. Id. at 19. Notwithstanding Metricom's failure to explain why the frequency tolerance is even necessary, it has painted an unrealistic picture of the cost impact on non-multilateration services due to the current frequency tolerance. To achieve the wide distribution contemplated for many new services such as automatic toll collection and commercial vehicle management, non-multilateration mobile transponders must be relatively inexpensive.

To meet the current 2.5 ppm frequency tolerance, the active transponders of the type used in systems now being installed by Hughes would require addition of a frequency-synthesized, phase-locked oscillator with a high quality, temperature-compensated crystal reference. The additional costs to meet the frequency tolerance in the current rules alone would more than double the price of existing devices. With numbers of transponders deployed expected to reach the tens of millions, these prices will be prohibitive for many applications, especially those installed on behalf of state and local public safety authorities. This restriction on the ability to establish new non-multilateration services is especially

troublesome in view of the fact that, as previously discussed, there is little if any technical justification for the current rule.

BLANKET LICENSING

The Interagency Group has proposed blanket licensing for non-multilateration systems that are part of extensive public safety networks. As an LMS contractor for several such projects, including the I-75/AVION and HELP programs, Hughes agrees that blanket licensing will reduce the administrative burden on both state transportation and Commission officials. Therefore, Hughes supports a blanket licensing proposal for such systems, provided that sufficient location and technical information is available for effective system planning and frequency coordination. Blanket licensing should include a requirement for notice filings providing specific information for each non-multilateration base station installed under a blanket license.

NON-MULTILATERATION HEIGHT AND POWER RESTRICTIONS

Like Hughes, several parties have opposed the proposal of AMTECH to permit field strength measurements as an alternative to height/power restrictions for non-multilateration systems adopted in the new rules.[4/] As Hughes and others have explained, AMTECH's proposal of allowing up to 90 dB μV/m at one mile from the emission source, when measured in typical, partially-obstructed environments, would actually permit power

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4. See, e.g., UTC Consolidated Comments on Petitions for Reconsideration at 12; Telecommunications Industry Association Comments on Petitions for Reconsideration at 13-16; ITRON, Inc. Opposition to Petitions for Reconsideration at 2-3; Part 15 Coalition Opposition to Petitions for Reconsideration at 14-15; Southwestern Bell Mobile Systems Opposition and Comments in Response to Petitions for Reconsideration at 22-23.

levels for non-multilateration systems orders of magnitude higher than those currently set forth in the rules. In addition, AMTECH has not explained adequately how its proposal would be implemented. For example, would field strength measurements at one mile actually be required to be taken and provided to the Commission? Moreover, is one mile the appropriate distance, in view of the highly localized nature of most non-multilateration systems? AMTECH's proposal, as it now stands, presents a significant risk of interference to neighboring LMS systems, and should be rejected.

The Commission adopted the current height and power limits after thorough consideration of a number of comments squarely addressing the issue, as well as the broader issue of inter-system interference. Hughes believes that a limit of 30 watts ERP at a height of fifteen meters provides more than adequate coverage for the vast majority of conceivable non-multilateration services. In the rare instance where greater antenna height and/or ERP are needed, the Commission has the power to grant a waiver of the limits contained in the rules.

LOW POWER EMISSION MASK

AMTECH has proposed a modification of the LMS emission mask for low power transmitters, recommending that the Commission follow existing rules for land mobile systems, which provide an out-of-band attenuation requirement of 43+10 log (P) for transmitters with two watts or less of output power. AMTECH Opposition at 18-19. Hughes has reviewed this proposal, and agrees that it will effectively prevent interference for low power LMS transmitters as well. Hughes joins AMTECH in recommending adoption of the proposed change.

MESSAGING SERVICES

Several parties have expressed concern that LMS systems may become "general messaging or interconnected voice or data services." UTC Comments at 3-4.[5/] While Hughes concurs that communications between vehicles and fixed stations should conform to the Commission's requirement that they be "related to the location or monitoring functions of the system," (47 C.F.R. § 90.353(b)), different kinds of vehicle-related information may be included in the "monitoring" function. These include traditional vehicle information such as cargo, licenses, weight, and mechanical status messages, as well as more detailed information such as vehicle histories, detailed route planning and road condition information, service availability and descriptions, etc.

Non-multilateration systems are already providing a variety of services to the public, and the nature and scope of those services will continue to expand as vehicle-to-roadside links become more widespread. Hughes urges the Commission to preserve non-multilateration LMS providers' flexibility in the types of vehicle-related communications available to the public. For non-multilateration systems, which are coverage-area limited and cannot blanket large regions with message traffic, the Commission should reject the proposal by UTC to place limits on message duration or interval. See UTC Consolidated Comments at 5-6.

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5. See also id. at 4 n. 5 (listing other parties that have commented on LMS messaging rules).

CONCLUSION

In its LMS rules, the Commission has carefully balanced the concerns of several widely diverse interest groups. For the most part, the resulting regime is well thought out, and is supported by the record. Many of the revisions proposed in the reconsideration process merely revisit issues that have been explored in great detail earlier in this proceeding. As for the frequency tolerance restriction for non-multilateration systems, however, the record offers little if any support for the rule that was finally adopted. As described herein and in Hughes' Petition for Reconsideration, this rule presents a compelling case for reconsideration by the Commission. In addition, several other minor changes to the rules also may be warranted, as discussed above. These changes in the new rules will provide both the certainty and the flexibility to allow the non-multilateration LMS industry to improve and expand the rich variety of services available.

Respectfully submitted,

HUGHES TRANSPORTATION MANAGEMENT SYSTEMS

By: _____

Gary M. Epstein
Raymond B. Grochowski
LATHAM & WATKINS
1001 Pennsylvania Ave., N.W.
Washington, D.C. 20004

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Reply to Oppositions to Petitions for Reconsideration was served by First Class Mail, postage prepaid, on June 5, 1995, upon:

Henry M. Rivera, Esq.
Larry S. Solomon, Esq.
Ginsburg, Feldman & Bress, Chtd.
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

Henry Goldberg, Esq.
Henrietta Wright, Esq.
W. Kenneth Ferre, Esq.
Goldberg, Godles, Weiner & Wright
1229 Nineteenth Street, N.W.
Washington, D.C. 20036

David E. Hilliard, Esq.
Edward A. Yorkgitis, Jr., Esq.
Karen A. Kincaid, Esq.
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006

Andrew D. Lipman, Esq.
Catherine Wang, Esq.
Swidler & Berlin, Chartered
3000 K Street, N.W
Suite 300
Washington, D.C. 20007

John J. McDonnell, Esq.
Reed Smith Shaw & McClay
1200 18th Street, N.W.
Washington, D.C. 20036

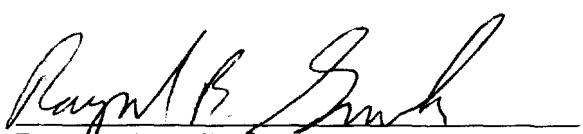
Theresa Fenelon, Esq.
Pillsbury Madison & Sutro
1050 Connecticut Avenue, N.W.
Suite 1200
Washington, D.C. 20036

David E. Hilliard, Esq.
Edward A. Yorkgitis, Jr., Esq.
Michael K. Baker, Esq.
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006

McNeil Bryan
Uniplex Corporation
2905 Country Drive
St. Paul, MN 55117

Louis Gurman, Esq.
Jerome K. Blask, Esq.
Nadja S. Sodos, Esq.
Gorman, Kurtis, Blask
& Freedman, Chartered
1400 16th Street, N.W.
Suite 500
Washington, D.C. 20036

Jeffrey L. Sheldon, Esq.
UTC
1140 Connecticut Avenue, N.W
Suite 1140
Washington, D.C. 20036



Raymond B. Grochowski